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Abstract

Recent advances in information technologies provide employees the freedom to work from any place and at any time. Such temporal and spatial dispersion, however, weakens the ties that bind organizations and their members. We suggest that organizational identification may be the critical glue linking virtual workers and their organizations. We explore the role that information technologies play in the creation and maintenance of a common identity among decoupled organization members. (*Virtual Work; Organizational Identification; Communication Media*)

Computer-mediated communication technology is becoming the backbone of many organizations, supplanting the formal hierarchical structure to achieve coordination and manage relationships within and between organizations. Electronic communications fuel the growth and effectiveness of an organization and its parts. Information, rather than being limited, controlled, and a source of power, appears to be instrumental for greater effectiveness when widely disseminated and freely available in so-called virtual electronic organizations.

Daft and Lewin, 1993, p. iv

This statement reflects an emerging reality of work in many organizations. Spurred by advances in information technologies, many organizations have begun experimenting with virtual ways of working. Included in these ways of working are modes such as telecommuting, working from satellite centers, mobile work, and the like. Indeed, in some organizations, it is no longer important when you work and where you work, as long as the work gets done.

These new organizational forms represent important shifts in the organization of work. For most of this century, large corporations have created mass-production systems that have required the congregation of organizational employees at central places of work (Garud and Kotha 1994). The advent of information technologies, however, has enabled a decentralization of work (Lucas and Baroudi 1994). Specifically, it is now possible for organization members to work together while being spatially and temporally decoupled from one another.

For instance, salespeople can colocate with their clients even as they access databases and their distant colleagues to accomplish their tasks. Others can isolate themselves in their homes or telecenters to provide undivided attention to the completion of a task while they remain connected with their work through electronic means. Still others can work off their laptops as they travel. These changes, and the flattening and decentralization of organizations that they bring, raise new challenges for organizing in a virtual setting. Specifically, the very technologies that offer employees the freedom to work any time and anywhere may also lead to a fraying of the ties that bind organization members to each other and to their employer.

Traditional organizations rely upon relatively explicit and concrete factors to serve as the basis for linkages between employees and the organization. For example, some of the cues that pull employees together in more traditional organizational settings include dress codes, shared language, shared organizational routines, and organizational identifiers such as organization charts, office buildings, and colocated employees. These elements are less readily available and less indicative of meaning in a

virtual context, however. Consequently, the links between virtual employees and their organizations may be less tangible and more social and psychological in nature (Heydebrand 1989, Raghuram 1996). Additionally, the dispersion and dislocation characterizing employment in virtual systems strain the psychological ties between organizations and their members. Thus, there is a danger that organizations could be pulled apart by the fragmenting forces that influence virtual systems.

We suggest that organizational identity (defined as members' shared beliefs about the organization's central, enduring, and distinctive characteristics; Albert and Whetten 1985, Ashforth and Mael 1989, Dutton and Dukerich 1991) may be a critical factor holding virtual organizations together. However, in a virtual context cues that traditionally created organizational identification are not available. Consequently, a key question is—*How do employees in a virtual context build and sustain organizational identification?* In this paper, we propose that communication may be an answer to the question. We further propose that the effects of communication on organizational identification may depend upon an individual's virtual work status.

Our paper is organized as follows. First, we consider the construct of organizational identification and its importance in a virtual work context. Next, we examine the relationship between communication and organizational identification with specific reference to type of communication media. We then proceed to explore the role of virtual status as a moderator of the relationship between communication modes and employees' identification.

Organizational Identification and Communication Processes

Organizational Identification

Identification is a means by which organizational members define the self in relation to the organization (Turner 1987). Thus, identification represents the social and psychological tie binding employees and the organization—a tie that exists even when employees are dispersed. An organization's identity provides members with an answer to the question, "What is the nature of this organization?" Furthermore, by defining the organization, an organization's identity guides members' feelings, beliefs, and behaviors (Dutton and Dukerich 1991).

Research on member identification, which refers to the strength of an individual's cognitive attachment to the organization (Dutton et al. 1994), suggests that strength of identification determines some critical beliefs and behaviors. Among them are employees' feelings of interpersonal trust, goal-setting processes, internalization of

organizational norms and practices, desire to remain with the organization, and willingness to cooperate with others (see, for example, Dutton et al. 1994, Kramer 1993). Identification defines the norms and conventions that individuals utilize to coordinate their behavior, and it creates opportunities for organizational learning (Kogut and Zander 1996).

Identification may be essential to sustaining virtual organizations because it facilitates critical organizational functions that pose a particular challenge in virtual contexts, such as the following: a) coordination and control of dispersed organizational actors; b) work group functioning; c) encouragement of extrarole helping behaviors; and d) retention of valuable employees. The importance of organizational identification in meeting the challenges of virtual organizations may be best illustrated through the use of an example. Consider one challenge that arises in the virtual context: difficulty in maintaining coordination and control when employees are dispersed. Coordination and control are essential to organizational efficiency and effectiveness because organization members' productivity depends upon their ability to formulate reliable expectations about others' behavior and to rely on others to perform the functions that they are assigned in a consistent and timely manner. Many virtual workers (such as salespeople) must serve as representatives of, or emissaries for, the organization. In such instances, it is critical to an organization's competitive position that different virtual employees represent the organization in a consistent manner. Achieving coordination and control is increasingly difficult as more organization members are expected to perform functions that are not fully predictable, not easily measurable, and that require high levels of interaction with others, factors which may complicate workers' ability to perform virtually (e.g., DeSanctis 1984).

To achieve coordination and control, traditional organizations rely on various means of performance monitoring such as direct supervision and the enforcement of rules and procedures. However, traditional means of coordination and control may be ineffective and even dysfunctional when employees are dispersed in a variety of workplaces (Blake and Suprenant 1990). For example, direct supervision is generally an expensive means of insuring coordination and control. The fact that supervisors and subordinates are not colocated in a virtual setting means that even greater time and investment in technology is required to facilitate performance monitoring. As a result, supervision may be more costly and less likely to be effective in a virtual context (a fact that may contribute to findings from previous research which indicate

that supervisors have less positive attitudes to telecommuting than lower-level workers (DeSanctis 1984; Duxbury et al. 1987)). When employees are dispersed, it is also more difficult to enforce organizational rules and adherence to standard procedures.

Because the virtual context complicates efforts to externally control employees, research suggests that virtual organizations should replace external controls with internal controls such as trust, employee motivation, and the convergence of individual and organizational goals (e.g., Blake and Suprenant 1990, DeSanctis 1983, Lucas and Baroudi 1994). Organizational identification, which provides a psychological link between the organization and a dispersed workforce, may facilitate coordination by promoting convergent expectations (Kogut and Zander 1996). Identification motivates members to coordinate their efforts to achieve organizational goals by enhancing interpersonal trust and cooperation (Brewer 1981; Kramer and Brewer 1984, 1986). Additionally, research suggests that members who identify strongly with the organization are more likely to (1) accept organizational goals as their own personal goals, (2) attend to superordinate goals, and (3) be loyal and obedient (Dutton et al. 1994). Organizational identification is expected to correlate with work effort, willingness to perform extrarole behaviors, and task performance (Dutton et al. 1994). Thus, through its impact on employees' motivations, organizational identification facilitates coordination and control without the need for costly (and possibly ineffective) systems of supervision and monitoring.

In sum, we argue that organizational identification may help organizations meet some of the most critical challenges of the virtual work context, such as ensuring coordination and control. Organizational identification accomplishes these feats through its influence on employee expectations, motivations, and consequent behaviors. Thus, we suggest that organizational identification may be a particularly effective and efficient means by which a virtual organization can accomplish its goals and insure performance.

These arguments provide evidence of the usefulness of organizational identification among virtual employees. What remains unclear is how identification can be strengthened in a virtual context, particularly because the traditional means by which member identification is created and sustained (i.e., shared dress, architecture, and other artifacts) may not be available to virtual workers. Thus, virtual organizations may find themselves in a catch-22 situation: On the one hand, maintaining the organizational identification of virtual employees is especially critical because it helps organizations meet the

challenges of managing dispersed employees (e.g., obstacles to coordination and control). On the other hand, virtual employees are the least likely to be exposed to organizational factors that have traditionally strengthened member identification. When we recognize that the determinants of identification among virtual workers may differ from those of nonvirtual employees, it becomes important to identify the factors that create and sustain identification of virtual employees.

Communication and Organizational Identification

Research regarding the effects of communication on individuals' attitudes toward the organization (e.g., Huff et al. 1989, Sproull and Kiesler 1986) provides a theoretical link between communication and organizational identification. Specifically, research has found that communication can affect employee attitudes that may be strongly related to organizational identification.

Communication can strengthen member identification because it provides organization members with an opportunity to create and share their subjective perceptions of the organization's defining features—its norms, values, and culture. Knowledge of these facets of the organization may create a sense of shared meaning among employees. Communication helps create shared meaning because it provides social context cues (Sproull and Kiesler 1991), which lead to the perception of social presence (Fulk and Boyd 1991), and creates a shared interpretive context among organization members (e.g., Zack 1993). Shared meaning provides organization members with a clear sense of the organization's identity, and thus may strengthen member identification.

A complementary way that communication may strengthen employees' organizational identification is by providing workers with a feeling of ownership in the shared meaning that has been created because they feel that they have helped develop it. Supporting this argument, research suggests that the frequency with which individuals communicate with others in the organization enhances organizational commitment because frequent communication leads individuals to feel that they are active participants in the organization (Huff et al. 1989). This sense of active participation may lead employees to feel that they have greater control in the organization (Huff et al. 1989). Furthermore, the public act of participating without being coerced to do so may lead individuals to feel more positively about the organization and, therefore, to identify themselves with the organization more strongly (e.g., Huff et al. 1989, Kiesler 1971, O'Reilly and Caldwell 1981).

Properties of Communication Media and Their Effect on Organizational Identification

In exploring the link between communication and organizational identification, it is important to note that individuals' virtual status (i.e., the degree to which they operate from traditional offices or from dispersed locations) leads them to utilize different communication media. For instance, face-to-face communication is an important medium available to employees working in traditional offices. For those working virtually, however, face-to-face communication with organizational members is less likely. Instead, virtual workers have to rely on e-mail and the telephone as the media of necessity.

Early research investigating the effects of alternative means of communication on organization members was guided by information richness theory (e.g., Daft et al. 1987). This perspective implicitly assumes that communication media possess characteristics that make them more or less effective on various dimensions (Fulk et al. 1987). For example, face-to-face communication tends to convey social context cues very strongly (Sproull and Kiesler, 1986, 1991), and has been found to be particularly effective in creating social presence (Fulk and Boyd 1991) and a shared interpretive context among organization members (e.g., Zack 1993). In contrast, e-mail and phone communication are not as rich as face-to-face communication in their ability to convey social context cues (e.g., Sproull and Kiesler 1986; Trevino et al. 1987), and therefore e-mail and phone may be less effective as a means of creating and maintaining organizational identification.

Recent research complements and extends information richness theory by considering the effects of the social context in which communication is embedded (Markus 1994). Markus suggests that, in addition to the inherent properties of the media itself, the social context (e.g., norms, culture) must be considered in order to determine the impact of different communication media on individuals. For example, although face-to-face discussions seem most appropriate to executing unstructured and ambiguous tasks in general, some work groups may develop norms of utilizing relatively lean media (such as e-mail) for such tasks. In these instances, emergent norms allow e-mail to convey more meaning and have greater impact on communicators than it would in a different context.

Extending this idea even further, research on technology in general (e.g., Barley 1986, Garud and Rappa 1994), and communication technologies in particular (Orlikowski 1992), has taken a structuration perspective, acknowledging the reciprocal and coevolutionary dynamics between technology and organizations. From this perspective, not only does the social context (e.g., norms and

patterns of use) influence technology and its impact on individuals, but, in turn, technology may also determine the evolving social context by influencing the creation of norms in use. That is, technologies and how they are used coevolve with their social contexts. Applied to the present context, this perspective suggests that the virtual context and member identification may influence communication technology at the same time that the technology creates the virtual context and member identification.

To summarize, different communication media have different properties with respect to qualities of the media per se (i.e., the extent to which they contain social context cues and create a shared interpretive context), and with respect to predictors of how the media will be used (e.g., the level of accessibility and level of informality that they provide (see Table 1 for a summary)). These four properties, in turn, have implications for the impact of particular communication modes on the strength of members' organizational identification. Importantly, what one medium lacks in one dimension (for instance, the apparent paucity of social context cues in e-mail), it may make up in another (for instance, the high informality and accessibility of e-mail).

Virtual Status as a Moderator of the Relationship between Communication Media and Identification

Thus far, we have argued that various communication media possess properties that have differing implications for the creation and maintenance of organizational identification. If individuals' virtual status affects their use of communication media, then virtual status may impact the relationship between communication and identification. Of greatest relevance to the present research, some relatively lean media (with respect to information richness) may possess other characteristics that make them especially effective in creating identification in a virtual setting. For example, e-mail and phone media may be more accessible and informal than other media in a virtual work context. In particular, electronic communication is convenient, fast, allows for dynamic exchange of information, and provides broad access to other organization members (Huff, et al. 1989). While the informality of (especially) computer-mediated communication limits its ability to convey social context cues, that same informality may break down perceived hierarchies and promote a feeling of equality that may lead virtual workers to feel that they are central to the organization (Huff et

Table 1 Comparison of Communication Media with Respect to Accessibility, Formality, Shared Interpretive Context, and Social Context Cues (Derived from Previous Research)

	Face-to-Face	Document	Telephone	Electronic Mail
Accessibility/ Synchronicity	Synchronous with respect to time and place	Asynchronous with respect to time and place	Synchronous with respect to time; asynchronous with respect to place	Asynchronous with respect to time and place
Formality	Dependent upon communicators	Highly formal	Dependent upon communicators	Highly informal
Shared Interpretive Context	Facilitates <i>creation</i> of interpretive context	Not explicitly considered	Not explicitly considered	Facilitates communication within <i>established</i> interpretive context.
Social Context Cues	Strong	Moderate	Moderate	Weak

Note: *Illustrative sources for this table include Fulk and Boyd 1991; Lee 1994; Markus 1994; Sproull and Kiesler 1986, 1991; Trevino et al. 1987; and Zack 1993.

al. 1989, Sproull and Kiesler 1991). We suggest that when communication media are more informal, organization members are likely to feel that they are active participants in the process of creating and sharing the organizational identity. Members may therefore feel a stronger psychological tie to the organizational identity created through this social process.

Although research investigating this issue in the virtual context is not available, support for our arguments may be drawn from previous research suggesting that electronic communication is especially important as a source of commitment and involvement for more peripheral workers. For example, Eveland and Bikson (1988) examined the impact of electronic communication on one type of peripheral worker—retired employees. They conducted a field quasi-experiment involving two task forces in which half the task force members were recently retired. One task force was given electronic communication technology and another was not. While all retired people on the task forces rated themselves as “peripheral” at the outset of the experiment, six months later the retired members of the task force that communicated electronically were more involved than those who did not communicate electronically. In fact, the retired persons who communicated electronically were as intensely involved as the employed persons in both task forces. Although virtual workers differ in many ways from retired workers, the effects of electronic communication on their attitudes may be similar because the groups are alike with respect to their perceptions of being peripheral to remaining organization members.

Huff et al. (1989) offer further evidence that peripheral

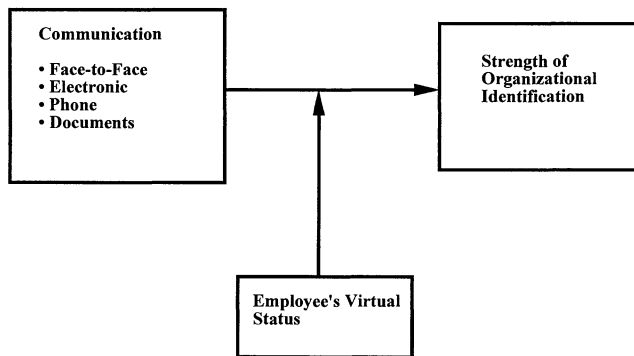
workers are particularly likely to benefit from electronic communication in their study of the effects of electronic, telephone, and document communication on the attitudes of city government workers. Their results suggest that only electronic communication is significantly related to organizational commitment. Moreover, the relationship between electronic communication and commitment was more pronounced for shift workers who, like virtual workers, may feel more isolated from others in the organization (although shift workers are temporally isolated while virtual workers are spatially isolated). To the extent that identification and commitment are related, these results suggest that electronic communication may be especially effective in creating organizational identification for virtual workers, possibly to a greater extent than for nonvirtual workers. Past research on the effects of communication media on the attitudes of peripheral workers lend further support to the model that we empirically explore.

Our core proposition is the following: *Virtual status will moderate the relationship between mode of communication and identification* (see Figure 1).

Research Design and Methodology

Sample

Our study was conducted in the sales division of a large international computer company that had recently (within the previous six months) implemented a mandatory virtual work program. The program was initiated both for

Figure 1 Virtual Status, Communication, and Organizational Identification

cost reduction (minimizing real estate expenses) and strategic (encouraging closer contact with clients and customers) purposes. A total of 325 employees were surveyed, with 276 responses received (overall response rate = 85%).

Most employees were using a combination of different work modes in a given week. The typical employee would utilize office space for a portion of the week and work out of his or her home and/or clients' offices the remainder of the time. The median number of days that employees worked from traditional offices was only two days per week. About a third of the employees utilized office space for a day or less in a typical week. The rest of the time these employees were working from home or in a mobile mode (e.g., from clients' offices).

The sample offered us wide variation in work modes utilized by employees. Approximately half of the respondents spent the majority of their work week in virtual mode (less than two days in the office), and may thus be viewed as employees with a relatively higher virtual status than their desked (i.e., in-office) counterparts. The second half of the respondents spent more than two days per week in the office, and thus may be viewed as employees with a lower virtual status. This variation was ideally suited for the purpose of this research and provided a basis for comparing the communication patterns of these workers and their linkage with organization identification.

Measures

Virtual Status. We asked the respondents to describe their workweek with respect to the days spent working in the office, at home, or in mobile mode. Respondents reported how many days per week they spent in each work mode, with responses ranging from zero to seven (in half-day increments) for each work mode. We included a possible seven-day workweek because individuals in the organization and job categories that we examined might

work every day of the week, especially if they have the option of working out of their homes.

We generated a "virtual status" variable that captured the number of days that any employee spends in the office. In creating this variable, we anchored on the number of days in the office because: (1) outside the office, an employee could be in any virtual mode such as working from home, clients' offices, or on the road, and (2) working in any of these virtual states implies lack of access to face-to-face meetings and other organizational cues that would be available in the office. Higher scores on this measure indicate a greater number of working days in the office and thus a relatively low virtual status, while lower numbers indicate fewer days in the office and thus a higher virtual status.

Communication with Organization Members. The effects of the myriad factors relevant to different communication media (including those identified by information richness theory and those identified by theories that explicitly consider the impact of the social context) may be manifested in different behaviors with regard to the use of communication media. In particular, the inherent properties of the medium itself as well as factors such as norms for how the media are used (e.g., how informally it is used) may all combine to determine how frequently a particular medium is utilized.

Respondents were asked to report the frequency with which they communicated with organization members (i.e., their peers, supervisor, and subordinates) in an average week, using each of four communication media: face-to-face meetings, electronic communication (primarily e-mail), documents (e.g., paper memos and reports), and telephone. These four communication media were chosen for theoretical and practical reasons. From a theoretical perspective, previous research has extensively investigated and compared these four communication media (e.g., Huff et al. 1989, Sproull and Kiesler 1991, Zack 1993). Although there is some research on a larger set of more innovative communication media such as videoconferencing or groupware (e.g., Dumville and Breneman 1996, Morrison and Liu Sheng 1992), these other media have not been investigated as extensively as the original four. Also, the theoretical models exploring the relationships between these innovative media and the other four media are not fully developed. From a practical perspective, in the organization in which we conducted our study (like many other organizations that are in the early stages of implementing virtual work initiatives), novel communication media are inaccessible, unaffordable, and seldom used.

We asked respondents to indicate the frequency of, for

Table 2 Descriptive Statistics for Use of Different Communication Media

		Subordinates	Peers	Supervisors	Overall Mean Across Constituents
Documents	Mean	4.03	3.79	3.6	3.84
	S.D.	(1.82)	(1.84)	(1.86)	(1.48)
	N	111	251	251	
Electronic	Mean	4.84	5.16	4.58	4.77
	S.D.	(1.84)	(1.6)	(1.92)	(1.34)
	N	111	253	255	
Face-to-Face	Mean	3.82	4.24	2.69	3.54
	S.D.	(2.04)	2.19	(1.88)	(1.62)
	N	117	254	254	
Telephone	Mean	4.68	5.11	4.14	4.6
	S.D.	(1.85)	(1.83)	(2.08)	(1.46)
	N	113	254	253	
Overall mean across media		4.34	4.58	3.81	

example, electronic communication with peers, supervisor, and subordinates. The response scales ranged from “very infrequent” (1) to “very frequent” (7). Responses for each of the three targets (peers, supervisor, and subordinate) were averaged to create a single measure of electronic communication with organization members.¹ Table 2 provides descriptive information about the communication patterns across different constituents and different media.

Organization Identification. Organizational identification was measured with the scale developed by Mael and Ashforth (1992). A sample item is “When I talk about [the organization], I usually say “we” rather than “they.”” Responses ranged from “strongly disagree” (1) to “strongly agree” (7). Coefficient alpha was 0.86.

Results

Descriptive Statistics

Table 3 provides the zero order correlations, means, and standard deviations for all variables used in our analyses. These variables include the virtual status of employees, the four communication media, and organizational identification.

To explore the precise nature of the relationship between virtual status and employees’ patterns of communication media usage, we computed fourth-order partial correlations of virtual status and each media in turn, controlling for identification and all other media types. Results indicate that the relationship between virtual status and face-to-face communication was significant ($r = 0.48$; $p < 0.001$), suggesting that higher virtual status

employees utilized face-to-face communication significantly less frequently. The remaining fourth-order partial correlations between virtual status and communication media were not significant.

Taking into consideration the relative convenience and efficiency of utilizing communication media from remote locations suggests that usage of certain types of communication media may not be independent. In particular, the communication media may cluster: virtual workers

Table 3 Correlation of All Variables (Correlation Coefficient/N)

	Mean (S.D.)	1	2	3	4	5
1. Virtual Status [#]	2.3 (2.15)					
2. Identification	5.23 (1.13)	0.01				
3. Face-to-Face	10.63 (4.87)	0.48	0.04			
4. Electronic	4.77 (1.34)	0.05	0.11	0.31		
5. Document	3.84 (1.48)	0.22	0.02	0.32	0.37	
6. Telephone	4.6 (1.46)	-0.05	-0.01	0.17	0.48	0.29

Note: # Higher scores on this measure indicate a greater number of working days in the office and thus a relatively low virtual status, while lower numbers indicate fewer days in the office and thus a higher virtual status.

may be less likely (than their in-office counterparts) to use face-to-face communication and documents, and more likely to use electronic and telephone communication. If so, by controlling for a type of media that is similar in convenience and efficiency, the fourth-order partial correlations may obscure meaningful relationships between virtual status and communication media.

We therefore computed the third-order partial correlation between virtual status and each communication media, controlling for organizational identification and the communication media that are expected to differ with respect to convenience and efficiency. Results suggest that higher virtual status workers were significantly less likely to utilize face-to-face communication ($r = 0.47$; $p < 0.001$), and significantly less likely to use documents ($r = 0.22$; $p < 0.05$). The partial correlation between virtual status and electronic communication was not significant ($r = -0.16$; n.s.). However, higher virtual status workers were more likely to use phone communication than their in-office counterparts ($r = -0.21$; $p < 0.05$).

Table 3 indicates that although the mean level of organizational identification was relatively high (5.23 on a seven-point maximum scale), there was no significant relationship between employees' virtual status per se and their level of organizational identification ($r = 0.01$; n.s.). We computed fourth-order partial correlations between virtual status and identification, controlling for the communication media variables, and the relationship remained nonsignificant ($r = -0.05$; n.s.).

The results of the regression analysis (Table 4; Model 1) also indicate that organizational identification was not directly related to the communication media utilized. Thus, when we do not differentiate between virtual and nonvirtual employees, there is no distinguishable relationship between the tendency to use any particular type of communication media and strength of organizational identification. This may be a function of the opposing forces of accessibility and informality of communication media on one hand, and the strength of social context cues and availability of a shared interpretive context on the other hand.

Virtual Status as a Moderator of the Relationship Between Communication and Identification

Our proposition was that virtual status moderates the relationship between communication media and organizational identification. We explored this proposition utilizing hierarchical multiple regression analysis (Cohen and Cohen 1975; Pedhazur 1982). Specifically, in Model 1, the main effects of frequency of use of each communication media and employees' virtual status were entered simultaneously (see Table 4, left column). In Model 2, all

four two-way interactions of communication and virtual status were simultaneously added to the main effects in Model 1 (see Table 4, right column).

No main effects were significant in Model 1. However, in support of our proposition, two interactions emerged as significant—the interaction of virtual status and frequency of electronic communication and the interaction of virtual status and frequency of telephone communication ($\beta = -1.61$; $p < 0.01$; and $\beta = 1.17$; $p < 0.01$ respectively).

The degree to which the interaction terms contributed towards explaining variance in organizational identification over and above the main effects (i.e., test for the significance of change in R^2) was significant. The interaction terms explained an additional 16% of the variance in organizational identification ($F_{\text{change}} = 5.201$; $p < 0.01$), providing support for our core proposition.

To explore the nature of the significant interaction effects, median splits were conducted on the virtual status variable (Pedhazur 1982). Identification was then regressed on the communication variables for each of the two subgroups (i.e., those who were more virtual, spending two days per week or less in the office, and those who were less virtual, spending more than two days per week in the office). Figure 2 and 3 are graphic representations of the interactions. Points were plotted for strength of organizational identification one standard deviation below the mean of electronic communication and phone communication and one standard deviation above the mean.

Figure 2 suggests that the virtual status by electronic communication interaction effect that emerged as significant in our regression analysis takes the following form: among higher virtual status employees, electronic mail communication creates a psychological link between individuals and the organization. Electronic communication does not appear to have the same effects for individuals who spend a greater proportion of their time in the office.

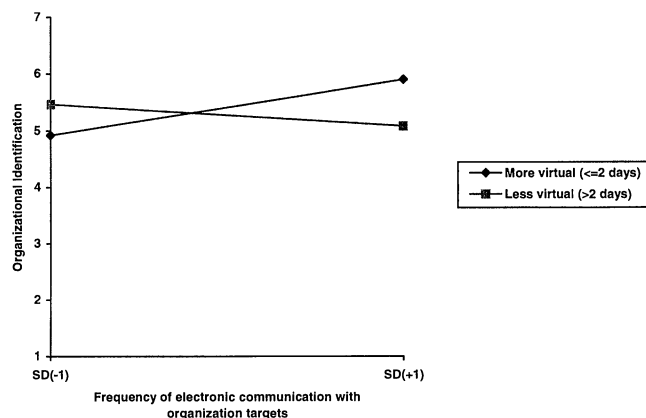
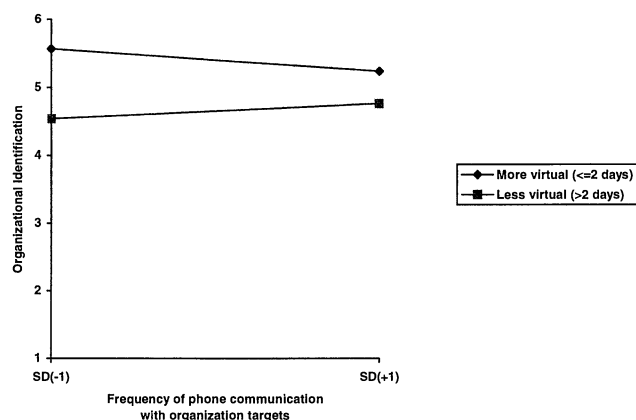
Higher levels of phone communication were related to weaker organizational identification among higher virtual status employees. In contrast, higher levels of phone communication appeared to lead to stronger identification among lower virtual status employees. Although phone communication did seem to strengthen identification among nonvirtual workers, it is relevant to note that within the identified range, the absolute level of organizational identification was higher among virtual workers than among less virtual workers.

In sum, electronic communication appears to be a more critical means by which high virtual status workers create and sustain their organizational identification relative to less virtual employees. Phone communication appears to

Table 4 Results of Regression of Organizational Identification on Communication Media and Virtual Status

	Model 1			Model 2		
	β	t	p	β	t	p
Virtual Status ^a	-0.03	-0.47	0.64	0.32	1.46	0.15
Frequency—Documents	0.02	0.18	0.86	0.01	0.08	0.94
Frequency—Electronic	0.18	1.75	0.08	0.65	3.72	0.00
Frequency—Face-to-Face	0.01	0.08	0.93	0.02	0.40	0.69
Frequency—Telephone	-0.12	-1.34	0.18	-0.45	-3.2	0.00
Virtual Status * Documents				-0.18	-0.46	0.65
Virtual Status * Electronic				-1.61	-3.30	0.01
Virtual Status * Face-to-Face				-0.20	-0.54	0.59
Virtual Status * Telephone				1.17	3.13	0.01
Overall F	F(5, 99) = 0.81; $p < 0.54$			F(9, 95) = 2.68; $p < 0.01$		
R Square	0.04			0.20		
Change in R Square				0.16		
Change in F				F(4, 94) = 5.201; $p < 0.01$		

Note: ^aHigher scores on this measure indicate a greater number of working days in the office and thus a relatively low virtual status, while lower numbers indicate fewer days in the office and thus a higher virtual status.

Figure 2 Organizational Identification as a Function of Virtual Status and Frequency of Electronic Communication**Figure 3** Organizational Identification as a Function of Virtual Status and Frequency of Phone Communication

be a more critical means by which low virtual status workers create and sustain their organizational identification relative to high virtual status employees.

Discussion and Implications

Our results provide support for the proposition that communication creates organizational identification, moderated by employees' virtual status. Specifically, although electronic communication was not a significant predictor

of organizational identification *across* levels of virtual status, results suggest that electronic communication was a critical predictor of identification among virtual employees.

The lack of significant results for face-to-face communication, either as a main effect determining identification or in interaction with work mode, has implications for the decentralization of entire organizations. In particular, the centralized office and the activities that used to be conducted there may no longer have the same level of

importance. Even those who come to the office every day may find that the absence of a significant number of their coworkers leads them to rely less on face-to-face communication to create a "system of meaning" and a sense of organizational identification. These results suggest that the impact of virtual initiatives may be felt both by segments of the organization in which workers are dispersed and among those who remain in traditional centralized offices.

Employees' virtual status appears to play an important role in the means they use to build organizational identification. These results perhaps point toward the ease with which virtual employees may be able to access electronic media, and possibly to the more varied and substantial purposes for which they use electronic mail. In contrast, those in the office may find the phone more accessible and may be more likely to rely on it for complex interactions. These differences may be an important area for further exploration.

The present findings have implications for the study of organizational identification and virtual work. We suggest that identification is the psychological tie that binds scattered employees together into an organization, rather than a collection of incidentally related individuals. Without organizational identification, virtual workers may view themselves as merely independent contractors, operating autonomously and without consideration for the organization that employs them. It is therefore important to determine the factors that maintain and sustain organizational identification in a virtual context.

Implications for Research on Virtual Work

Our results lend further support to the results of previous research which have found that electronic communication plays a key role in maintaining the involvement of various types of peripheral workers, including shift workers (Huff et al. 1989) and retired employees (Eveland and Bikson 1988). The present research extends these findings into the arena of an important emerging employment relationship; namely, virtual work. For virtual workers, electronic communication may be far more convenient than other means of contact, and may enhance the sense that virtual workers and their in-office counterparts are accessible. The informal nature of electronic and telephone communications may also make status and department and job differences less salient. Because they provide less individuating information, such means of communication may encourage virtual workers to conceive of themselves as part of a larger whole.

Our findings pertaining to organizational identification and virtual work are encouraging and point to an important facet of virtual work that is worthy of deeper inquiry.

Specifically, research focused on new organizational forms must consider both the "system of work"—which refers to the technical facets of production of goods or services in the organization—and the "system of meaning"—the institutional facets of the organization, specifically the values attached to the work engaged in (Scott 1991, Selznick 1957). Organizational identification is a part of a larger construct that has to do with the creation and preservation of the "system of meaning" in these new emerging work forms.

The flattening and decentering of organizations raise challenges for organizing in a virtual setting. The very technologies that offer employees the freedom to work anytime and anywhere also detract from the creation of a shared reality essential for the formation of stable work expectations. Many organizational cues that served as the basis for the creation of a shared reality among employees (including dress codes, shared language, and shared organizational routines) are less readily available in a virtual setting. Consequently, there is a danger that organizations operating in a virtual system could be pulled apart by the centrifugal forces that so heavily influence virtual organizations. Stated differently, although virtual work enables an organization as a system of work, it has the potential to constrain an organization as a system of meaning for its virtual participants. And it is this area that researchers and practitioners might want to focus on to create greater benefits from new emerging work forms such as virtual work.

Implications for Research on Electronic Communication

Our results and those of previous research serve to draw attention to the important role that electronic communication plays in many organizations. Past research strongly supports the idea that e-mail has altered the patterns and content of communication (e.g., Sproull and Kiesler 1991). For example, e-mail messages have been found to contain high socioemotional content (Adams et al. 1993, McKenney et al. 1992, Zack 1994). Adams et al. (1993) suggest further that electronic mail is more likely to enhance organizational information-processing and decision-making capabilities, and may therefore be preferred for intraorganizational communication.

Other research suggests that organization members who receive e-mail are not passive recipients of data, but active producers of meaning (Lee 1994, Markus 1994). In one study, Lee (1994) found that in interaction with the e-mail system, managers transform the data into information they find meaningful. Lee suggests that richness or leanness may not be an inherent property of the electronic mail medium. Rather, communication richness

emerges through the interaction of the e-mail system with its organizational context. These findings help explain why a means of communication as relatively lean as electronic mail may play such a crucial role in employees' efforts to create a system of meaning and to sustain their identification with the organization.

Considering the strong relationship that emerged between electronic communication and organizational identification and the unexpected result that face-to-face communication was not strongly related to identification, our findings suggest that electronic media are particularly important in the maintenance of organizational identification. These results support the social definition model of communication media (Markus 1994). However, it is possible that face-to-face contact is more critical in *creating* organizational identification (in accordance with information richness theory), which may then be *maintained* through other, less rich communication media (following the social definition model). Thus, the two models may both apply to the relationship between communication and identification, but one may be more appropriate in explaining the creation of identification while the other describes identification maintenance. Further support for this speculation is derived from prior research suggesting that rich communication media are useful for creating a shared interpretive context, while lean communication media such as e-mail are effective for communication within an already established interpretive context (e.g., Zack 1993).

The above argument is intuitively appealing because it is likely that when one first enters an organization, social context cues that communicate where one fits in and relates to others are of primary importance. In this situation, individuals may be particularly concerned with understanding others and the self as an individual, for which purpose social context cues are very useful (Sproull and Kiesler 1986, 1991). However, after being socialized to the organization, individuals may be more concerned with being central rather than peripheral in involvement (Van Maanen 1975). Their emphasis may switch from understanding how the self is distinct from others to how they are similar to others in the organization. Thus, the maintenance of cognitive identification with the organization may be more likely to come from communication means that provide fewer social context cues and thus allow an emphasis on equality and egalitarianism (Huff et al. 1989). These features are more relevant to how a communication medium is used than to any inherent qualities of the medium per se. Thus, it is possible that theories that take the social context into account are more appropriate for understanding how identification is maintained.

It is important to note that many organizations make the transition from a traditional mode to a virtual mode rather than start up as virtual organizations *de novo*. For these organizations, the maintenance of member identification rather than its creation is of critical concern. The findings from our study are especially applicable to such organizations.

Implications for Research on Organizational Identification

Our findings extend current research regarding the determinants of organizational identification. The current literature acknowledges that certain visible signs of affiliation, such as shared dress and other artifacts surrounding one in a conventional office (e.g., architecture and mementos that remind employees of their link to the organization) facilitate organizational identification (Dutton et al. 1994). This model of organizational identification seems primarily applicable to individuals who work under traditional conditions, i.e., commuting to a central location regularly where they have intense contact with colleagues, supervisors, and subordinates. Relatively unrecognized is the fact that traditional employment conditions and communication with other organization members are related—communication is likely to be relatively frequent in such contexts. Our results suggest that in a virtual work context, communication (and particularly electronic communication) is an important determinant of organizational identification. Future research may further investigate the role of communication frequency and medium in creating and maintaining member identification.

Furthermore, the present study suggests that organization members may differ with respect to the determinants of their organizational identification. It seems that some factors may be more important determinants of identification among more traditional workers (e.g., phone communication) while other factors (e.g., electronic communication) may be more important for individuals who operate in a virtual work context. It is likely that other nontraditional work modes may similarly require new models of organizational identification. For example, contingent workers, who work for an organization on a temporary basis, may depend on very different cues to determine their level of organizational identification than do full-time, permanent employees.

Practical Implications

Our results suggest that managers in virtual organizations should be attentive to the communication media used. Typically, organizations take communication media for granted, partly because face-to-face interaction among colocated employees emerges naturally, and may not require that a routine or pattern be established formally. If,

as our results suggest, electronic and telephone media are important determinants of organizational identification, then managers must provide the “hardware” to facilitate this communication and the “software” to encourage its usage. By hardware we mean the communication equipment (such as separate telephone lines at home, cell phones, e-mail systems, telephone conferencing, LAN) that is available to the virtual worker. By software we mean the training that enables the virtual worker in the use of the system.

In addition to providing training in the use of the system, it may also be important to create an organizational culture that encourages the use of on-line media to share task and nontask related information. Essential to this is an effort to establish an explicit protocol and set of procedures that help employees overcome their initial hesitation to use on-line communication media. These protocols may include transmitting certain messages only via an on-line media, or providing prompt replies to queries online.

While we are aware of the contribution of online media in determining organizational identification, we must bear in mind that on-line media are not a complete substitute for face-to-face contact. As Adams et al. (1993) note, it is important for organizations to enable face-to-face contact to further strengthen the group identity or organizational identity that is formed in virtual space. This idea is shared by many who echo the thought that “the more electronic communication expands and diversifies our circle of contacts, the more we’re going to want to add the dimension of face-to-face” (Goldberg 1997 p. A12).

Future Directions. Utilizing a cross-sectional research methodology, this study found that electronic communication was positively correlated with organizational identification among virtual workers, and phone communication was associated with identification among less virtual workers. These findings provide a foundation for exploring issues pertaining to organizational identification and virtual organization. For instance, future research may be directed at teasing apart the reciprocal and possibly coevolutionary dynamics between communication and identification, which would require a longitudinal research design. Some issues that may be addressed with a longitudinal study include whether certain communication media are particularly adept at *creating* organizational identification (e.g., face-to-face communication directed toward newcomers) while other forms of communication are better suited to *maintaining* identification.

Our study takes place in the context of a virtual work initiative whose characteristics are becoming more prevalent in organizations—specifically, a mandatory initiative intended to achieve cost reduction and strategic

goals, and implemented in a division of the organization which involves a great deal of contact with external clients. However, there is substantial variation in the nature of virtual work initiatives: many programs allow voluntary participation, are directed toward satisfying employee needs rather than competitive imperatives, and involve participants with jobs that are primarily directed at serving internal organizational clients. It is important to investigate the generalizability of the present findings to virtual work initiatives that differ with respect to such characteristics.

Another consideration in designing future studies is the utilization of alternative instruments for the independent and dependent variables (such as a combination of survey methods supplemented by direct observation or archival records of communication frequency). Such an initiative would allow us to tease out within-subject effects that we have not examined in this study because of the potential for common methods bias (that is, both dependent and independent variables were measured with the same instrument).

Conclusion

With advancements in communication technology, virtual work is rapidly spreading among organizations here and abroad. The latent potential of virtual work can be realized if we pay attention to factors that tie organizational members (distributed in time and space) together. In this context, we suggest that identification is an “organizational glue” that can tie employees together in a virtual setting.

Our large sample study is the first of its kind to examine the organizational identification of virtual workers. Results support our conceptual arguments, suggesting that virtual workers’ strength of identification with the organization depends upon the frequency of electronic communication with other organization members. This holds implications for both research on organizational identification as well as for managers of virtual work programs.

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Endnotes

¹Because each of the individual components of the measure represent only one portion of communication with organization members, they are supplementary, not alternative measures of each other. Specifically, individuals may be able to obtain the same information from different

targets, and may trade off contacting peers, subordinates, and supervisors.

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